

Process Automation

IMI CCI

VHB and VHBS Feedwater Heater Bypass Valves



Breakthrough engineering for a better world



VHB and VHBS

Bypass Valves

In thermal power generation, the feedwater heater uses heat transfer from extraction steam to preheat the feedwater, improving the overall plant efficiency. If the feedwater heater malfunctions then it needs to be isolated using a bypass system to allow maintenance without disrupting the flow of feedwater to the boiler. The bypass system consists of two on/off valves placed upstream and downstream from the feedwater heater, with two separate conduits connecting them. One conduit routes the feedwater through the heater, while the other bypasses it.

Key features

- Body manufactured with fully machined forgings.
- Two on/off valves.
- Three-way valves
- Built-in water hydraulic actuation as standard.
- Electrical, pneumatic or external waterhydarulic actuation available as options.

Benefits

- Protects feedwater heater steam jacket against tube rupture or leakage.
- Protects turbine extraction from excessive backpressure. Allows bypass of feedwater
- heater during peak loads to

disrupting flow.

electromechanical

- Easy maintenance.

the turbine.

Product specification and dimensions Actuator type

Valve type VHR VHRS

Selection Use IMI CCI PowerSiz sizing program

Leakage class ANSI class III (against bypass line) ANSI class V (against feedwater

Water hydraulic, pneumatic,

increase power output from

- Contoured plug to minimise

- Allows maintenance without

pressure drop of the trim.

Pressure class Up to ANSI-4500 (higher ratings may be achieved on request)

heater) Regulatory standards NP 6-10 - 16

ANSI CI.15

Water hydraulics

The VHB and VHBS with built-in water hydraulic actuators use the water pressure supplied by the feed water pump to open and close the valve. Stroke speed is controlled using a manual control valve installed in the pipe connecting to the evacuation valve. The valve can be secured in a closed position using a hand wheel installed on the yoke. During normal mode, the valves are kept open due to the internal pressure from the water flowing through the heater. Dump and evacuation valves are to be kept closed. It is also recommended that the filling valve is closed at this time. When transitioning to bypass mode, the evacuation valve should open and the filling valve should close, reducing pressure in the actuator's lower chamber. This will cause the valve plugs to close against the seat, putting the valves in bypass mode. Any water in the feed water heater piping is drained by opening the dump valve.



Application example

The VHB and VHBS with built-in water hydraulic actuators use the water pressure supplied by the feed water pump to open and close the valve. Stroke speed is controlled using a manual control valve installed in the pipe connecting to the evacuation valve. The valve can be secured in a closed position using a hand wheel installed on the yoke. During normal mode, the valves are kept open due to the internal pressure from the water flowing through the heater. Dump and evacuation valves are to be kept closed. It is also recommended that the filling valve is closed at this time. When transitioning to bypass mode, the evacuation valve should open and the filling valve should close, reducing pressure in the actuator's lower chamber. This will cause the valve plugs to close against the seat, putting the valves in bypass mode. Any water in the feed water heater piping is drained by opening the dump valve.



- A. VHB bypass valve
- B. VHBS bypass valve
- C. Feed water heater
- D. Boiler E. Feed water control valve





- 1. VHB
- 2. VHBS
- 3. Feed water heater
- 4. Dump valve
- 5. Filling valve
- 6. Evacuation valve
- 7. Feed water from tank
- 8. Water line to boiler

- F. Steam turbine
- G. Steam turbine bypass
- valve with dump tube
- H. Spray water control valve
- L Condenser
- J. Feed water tank
- K. Dump valve
- L. Feed water pump

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IMI CCI

CCI Valve Technology AB P O Box 603 661 29 Säffle Sweden Visit address Industrigatan 7 661 31 Säffle

www.imiplc.com/process-automation

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